

AMATEUR SATELLITE REPORT

AMSAT® NA Newsletter for the Amateur Radio Space Program



Amateur Satellite Report is endorsed by the
American Radio Relay League as the special interest
Newsletter serving the Amateur Radio Satellite Community

Number 183
September 26, 1988

Editor: Vern Riportella, WA2LQQ
Managing Editor: Bob Myers, W1XT

Copyright 1988 by AMSAT® NA, The Radio Amateur
Satellite Corporation. AMSAT® is a registered trademark.

Atlanta Groups Prepare For Space Symposium

Preparations are accelerating for the AMSAT Sixth Space Symposium says organizer Byron Lindsey, W4BIW. The Symposium will be held at the Atlanta Airport Marriott Hotel November 11, 12 and 13 and is being organized by AMSAT in cooperation with the Atlanta Radio Club.

Registration may be accomplished by mail. The address is:
Space Symposium
Box 29221
Atlanta, GA, 30359

The meeting will be held at the Airport Marriott Hotel, 4711 Best Road, College Park, GA. Rooms may be reserved by calling the hotel at 404-766-7900. Discounts may be obtained by mentioning the Space Symposium when reserving. The discounted price is \$65 per night.

Air fare discounts have been arranged with Delta Airlines. Reservations are being handled by GIT Travel Agency. Call 800-228-1777 for airline reservations.

A Symposium package deal including registration, Saturday lunch and the banquet is available for \$50 each. Tours have been arranged to the Cable New Network (CNN) facility in Atlanta. Register early to insure placement.

AO-13 Mode S Transponders Working Well

The first AO-13 Mode S transponder tests were successfully performed beginning at about 2025 UTC, September 17. Mode S transponder Project Manager Bill McCaa, KØRZ, says three stations were on during the first test run. They were Barry, VE4MA; Al, WB5LUA and Bill, KØRZ. Mode S uses an uplink at 435 MHz and produces a downlink at 2.4 GHz. Both CW and SSB QSOs were tried. It is believed the first Mode S QSO took place between KØRZ and VE4MA. KØRZ says the measured uplink bandwidth was 35 kHz ranging from 435.602 to 435.637 MHz. The measured downlink was 2400.717 to 2400.751 MHz Bill said. The Mode S transponder was activated under software control from MA 123 thru 134. Further Mode S transponder tests soon will lead to regular Mode S scheduling.

The AO-13 Mode S beacon tests performed during the week of September 11 were highly successful according to KØRZ. More than a dozen stations around the world have reported successfully hearing the 2.4 GHz beacon. Recent reports suggest good to excellent results may be obtained from very modest antennas. DF5DP used only a 20 dB gain yagi. KØRZ used a 3 foot grid dish converted from MDS (2.2 GHz) service. Bill says with the exception of the actual beacon frequency, all was as expected. The signal strength and power consumption and all other values were nominal.

The beacon was first heard near apogee on Tuesday, September 6. Al Ward, WB5LUA, calibrated the frequency as 2400.644 MHz. Several stations report hearing the Mode S PSK beacon 6 to 16 dB above the noise KØRZ says. WA3ETD says he also heard the beacon on September 6. The first Mode S beacon reception report from Europe comes from DK2ZF who says he first heard the beacon at 2103 UTC on September 8 using a 1.2m dish.

According to DB2OS, the Mode-S beacon was first manually activated on Monday, September 5 from 1223 UTC to 1248 UTC for an initial electrical check-out. When telemetry values showed the unit was electrically sound, an automatic software routine was installed in the IHU. The routine turned Mode-S on every apogee MA 123 to MA 134. Due to the power consumption of this transponder, Mode J was off during Mode S beacon operation. European stations reporting Mode S beacon reception include: ON6UG, G2BFO, IN3HER, DK2ZF and DF5DP.

In other AO-13 news, AO-13 was out of service Friday, September 9, for special Mode L radar survey tests. The tests showed a consistent AGC level of about -8 dB. This is in conflict with earlier data which showed a marked difference in AGC level related to antenna pointing. Additional tests may now have to be scheduled to resolve the ambiguity. The Mode L AGC survey began on Friday September 9 at MA 10 ran for 24 hours says DB2OS. Data was recorded in the IHU K-Block every 2 MA ticks. The establishment of an automated system on AO-13 for logging AGC levels has been successfully demonstrated and further telemetry inputs from listeners will be requested only as needed.

Testing of the RUDAK continues with AMSAT-DL engineers looking at ways of circumventing a glitch which prevents uplinking operational software. The RUDAK unit installed on a water tower in Munich is being used to model

the problem and test possible solutions. Testing will continue for an indeterminate period according to AMSAT-DL.

Here is the new AO-13 operating schedule:

Operating Schedule: V4.0 Effective 21Sep88

Mode	From (Inclus)	Thru (Inclus)	Remarks	Duration	
				MA	Minutes
Off	MA 241	MA 002	Solar eclipse window	18	48.3
Mode B	MA 003	MA 150		148	397.0
Mode L	MA 151	MA 200	Mode JL optional	50	134.1
Mode B	MA 201	MA 240		40	107.3
Mode S			Test window TBA*		
RUDAK			Status unknown		

*The new Mode S test window is To Be Announced.

Chicken Little Reprieved As RORSAT Dives In

by Ed O'Grady, KC2ZF

In June, 1982, AMSAT sponsored the first Chicken Little contest. The object of the contest was to predict the re-entry of a small, student-built Russian satellite called ISKRA-2. ISKRA, which means "spark" was built by students at the Moscow Aviation Institute. The 28 kg spacecraft was manually deployed from Salyut-7 by Cosmonauts Berezhovoy and Lebedev at 11:07 UTC, May 17, 1982.

The Chicken Little contest asked participants to predict as accurately as possible ISKRA-2's exact time of re-entry. The actual burnout time was determined to be 00:19 UTC on July 9, 1982. The closest "guesstimate" was made by Buzz Eggebrecht, W4BE, who missed the exact time by only 5 hours.

Now AMSAT has announced Chicken Little II (CL-II). The name Chicken Little comes from the children's story about a barnyard where one very nervous fowl runs about yelling "the sky's falling" when all that's really happened is he's been clunked on the head by the old fox.

Now the sky isn't really falling but a huge Russian spacecraft known as COSMOS 1900 quite apparently is! Thus, it's time for Chicken Little II.

Cosmos 1900 was launched from the Baikonur Cosmodrome on December 12, 1987, atop an SL-12 launch vehicle into a 65 degree inclined orbit. The RORSAT, or Radar Ocean Reconnaissance Satellite, contains a nuclear power reactor which was designed to be raised to a higher orbit prior to reentry into the earth's atmosphere.

COSMOS 1900 began to de-orbit last spring but Soviet ground controllers were unable to eject the reactor as planned. The satellite is doomed to a fiery reentry sometime in October experts predict.

In mid-September COSMOS 1900 was losing nearly 1 kilometer per day. Of course, many factors will come into play in the weeks ahead making the exact determination of re-entry a difficult task. Recall in January, 1978, COSMOS 954 disintegrated over Canadian territory spreading radioactive debris across a sparsely populated region.

In the weeks ahead, news media will be covering this

story in great detail. CL-II is an invitation for AMSAT members to calculate the reentry time and for the omniscient "prophet of doom" to win a new GaAsFET pre-amplifier for OSCAR use in the process.

Here are the rules:

1. The winner is the individual who most accurately predicts the date and time of reentry.

2. Enter as many times as you care to. Only one guess per entry letter or postcard. Entry must include name, address, callsign and AMSAT member number along with your guess to the nearest second.

3. Entries must be postmarked not later than seven calendar days prior to the official re-entry time.

4. Use of government resources is prohibited except that publicly available orbital data is OK.

5. Decision of the judges is final. No entries will be returned and are the property of AMSAT.

6. Entries must be mailed to AMSAT, CL-II, P.O. Box 27, Washington DC, 20044.

To assist in tracking COSMOS 1900, orbital elements will be included in the normal AMSAT Orbital Prediction Bulletin releases until de-orbit. The following is a recent set:

```
1 18665U 87101 A 88257.56414734 .00209291
2 18665 64.9565 263.5829 0015388 281.8493
78.0928 16.24918659 4444
```

Space Education Net To Employ SSTV

by K.O. Learner, K9PVW

Test transmissions of Slow Scan TV will continue as part of the Space Education Net (SEN; See ASR #182). Two black and white SSTV formats will be used for these tests. The standard 8 second format and the 34 second high resolution format will be transmitted. Later tests will include high resolution color SSTV. The SEN encourages all stations not equipped for SSTV to invite another amateur to bring Slow Scan converter to an AO-13 station. The addition of video will add a new dimension to the Space Education Nets.

Additional Net Control Stations are needed for the SEN. If you would like to assist the SEN in this important position please volunteer today. Contact K.O. Learner, K9PVW at P.O. Box 5006, Kokomo, IN 46904 or via packet @KD9BT with your SEN questions or comments or to volunteer to assist the SEN. Check-ins and participants are invited for both sessions.

Another Balloon Launch In Illinois Due

Another in a series of balloon-borne radio experiments is on tap from the mid-west. Bill, WB8ELK, says the next flight of a helium filled balloon carrying Amateur Radio equipment will be launched from Greensburg, Illinois, at 7:00 AM Eastern time, October 1. A 2 meter CW beacon will transmit on 144.340 MHz using vertical polarization. A fast-scan TV signal will be transmitted on 439.250 MHz using horizontal polarization. Last spring, a similar balloon attained an altitude in excess of 100,000 feet. Its radio beacons were heard from Canada to Iowa. Support nets will operate on 3871 kHz and perhaps 7155 kHz. The beacons will operate under the callsign W9PRD.

RS-12/13 To Be Launched In 1989 Builders Say

[Following is from the RS command station complex RS3A and provided by AMSAT-DL to whom we are grateful].

RS-12 and RS-13 are brothers of RS-10/11. RS-12 and RS-13 were built at the Tsiolkovskiy Museum for the History of Cosmonautics in Kaluga city, an industrial center 180 km southwest of Moscow. The chief architects of the project were Aleksandr Papkov and Victor Samkov. RS-12/13, a single combined unit, is mounted along with the COSMOS primary payload. It's a maritime navigation system for ships as was the primary payload of the RS-10/11 launch. Launch is scheduled for 1989. The circular polar orbit will have a height of 1000 km (621 miles), inclination of 83 degrees and nodal period of 105 minutes.

Here are the transponder details:

	RS-12	RS-13
MODE N"A":	uplink 145.910-145.950 downlink 29.410- 29.450 beacon 29.4081 (or 29.4543)	145.960-146.000 29.460- 29.500 29.4582 (or 29.5043)
MODE "K":	uplink 21.210- 21.250 downlink 29.410- 29.450 beacon 29.4081 (or 29.4543)	21.260- 21.300 29.460- 29.500 29.4582 (or 29.5043)
MODE "T":	uplink 21.210- 21.250 downlink 145.910-145.950 beacon 145.9125 (or 145.9587)	21.260- 21.300 145.960-146.000 145.8622 (or 145.9083)
MODE "KA":	uplinks 21.210- 21.250 145.910-145.950 downlink 29.410- 29.450 beacon 29.4081 (or 29.4543)	21.260- 21.300 145.960-146.000 29.460- 29.500 29.4582 (or 29.5043)
MODE "KT":	uplink 21.210- 21.250 downlinks 29.410- 29.450 145.910-145.950 beacons 29.4081 (or 29.4543) 145.9125 (or 145.9587)	21.260- 21.300 29.460- 29.500 145.960-146.000 29.4582 (or 29.5043) 145.8622 (or 145.9083)

Autoanswer "Robot"

modes	A; K; T; KA; KT	A; K; T; KA; KT
uplink	21.1291 and/or 145.8308	21.1385 and/or 145.8403
downlink	29.4543 and/or 145.9587	29.5043 and/or 145.9083

General Technical Data

DC POWER:		
All system OFF	4.6 W	3.5 W
All system ON (max. output)	35 W	25 W
RF OUTPUT POWER:		
Beacon and "Robot"(low/high)	0.45/1.2 W	0.45/1.2 W
Transponder TX (29 or 145)	about 8 W	about 8 W

Short Bursts

• A new dial-up voice space news service has just been placed on line. Called SPACHL, the Space Activities Hot Line carries the very latest news on amateur radio satellite operations, related radio nets and general world space activities. The 5 minute recorded announcement carries details of times and frequencies. It might be a good idea to record the bulletin since it goes by pretty fast. The number to call is 914-986-3875. SPACHL will be available 24 hours per day. Bulletins will be updated frequently to insure you get the latest scoop on what's happening.

• The 4th Annual Midwest Space Development Conference will be held in Dayton Ohio, September 30 through October 2. The conference will be held at the Holiday Inn on I-675 across from Wright State University. For further information, call 513-873-3232.

• AMSAT has re-instituted its traditional orbit sponsor program for support of operations by satellite users. AMSAT HQ has the details: 301-589-6062.

• Distribution of AMSAT bulletins via packet radio on AO-13 will begin on a trial basis shortly. Initially FSK will be used. Later PSK will be added. Finally, FSK will be phased out. The operating schedule will be announced shortly.

• In answer to many questions regarding the "Official AMSAT day" number seen in the AO-13 telemetry, DB2OS explains that day 0 is defined as January 1, 1978. That makes January 1, 1988, day 3652. Thus, September 10, 1988, the 254th day of the year is AMSAT day 3906.

• UAØALA, Anatol, has been on AO-13, Mode B, from his QTH in the eastern Siberian city of Krasnoyarsk. Watch for his strong SSB signal.

• RS-11 will be operating Tuesday thru Friday on Mode KA and weekends on Mode A. There is no RS-10 operation currently.

Clubs and Individuals Plan Extensive Shuttle Coverage

Extensive shuttle launch coverage is planned by various Amateur Radio clubs and groups. According to Goddard Amateur Radio Club president Frank Bauer, KA3HDO, the Goddard Club will air the launch and mission progress on numerous HF and VHF frequencies. In addition, the Goddard Club has coordinated AO-13 links with AMSAT-VP of User Operations WA5ZIB, so those with AO-13 Mode B receive capability anywhere in the footprint will have shuttle audio available. Launch is scheduled for September 29, NASA says. The club is based at NASA's Goddard Space Flight Center, Greenbelt, Maryland just north of Washington, DC.

WA3NAN will operate on AO-13 Mode B with a downlink frequency of 145.945 MHz (primary) or 145.955 MHz (alternate). Other frequencies include: 3.860, 7.185, 21.395, 28.650, 147.45 MHz.

The Goddard Club will run 3 or 4 of the HF frequencies at a time. Band conditions will determine which frequencies are actually used. For those in the Washington area, there is good news about receiving shuttle video via ATV. Plans call for a TVRO system to link to a local ATV repeater or to transmit ATV directly. The NASA Select channel on a commercial satellite would then be distributed locally. Further information may be obtained directly from KA3HDO at 301-577-0271 evenings.

ATV's in the San Francisco Bay area will also be treated to live shuttle TV coverage as the Mount Diablo and Black Mountain ATV repeaters are slated to provide full mission video. Contact N6GOZ or N6IIU for details.

World Space News Summary

The ambitious Russian Phobos 1 mission to Mars launched July 7 is in deep trouble. Apparently a technician load-

ed a faulty software program in early September. This caused Phobos 1 to lose its sun-seeking ability and thus became disoriented. As a result, it cannot be commanded and its solar panels are not towards the sun. The batteries are being drained. Director of the Space Research Institute in Moscow, Roald Sagdeyev, told the western press it would take a miracle to save the mission. Phobos 2 is doing well however. The failure of Phobos 1 and the Soyuz debacle earlier in the week together have tarnished the Soviet space programs which had until this week taken on a rare luster in leading a charmed life for the last three years the Moscow correspondent for the New York Times says.

NASA announced the shuttle launch of the Hubble Space Telescope will be pushed back eight months from June 1989 to February 1990. Additionally, the ASTRO-1, mission on which Ron Parise, WA4SIR, will fly, has been delayed four months. ASTRO-1 is now scheduled for March 1990. Two key planetary probes will be launched on schedule since they have a narrow window of opportunity. Magellan, intended to map Venus, will be launched next April. Galileo, a Jupiter survey, is scheduled for launch in October 1989. The delays were attributed to the shortage of rocket fuel caused by the massive explosion last May of a factory in Nevada NASA said.

The U.S. Air Force successfully launched a refurbished Titan 2 rocket from Vandenberg AFB Monday, September 5. The payload was reported to be a cluster of Navy ocean surveillance satellites called Project White Cloud. The Titan

2 launcher was the first of series to be launched using retired ICBMs refurbished by Martin Marietta. The successful Titan 2 launch follows a significant launch failure September 3 when a Titan 34D launched a military reconnaissance satellite to its transfer orbit but its upper stage apparently failed leaving it stranded in a useless, highly elliptical orbit. The transfer stage failed to reignite to circularize the orbit.

The U.S. government has given approval for the launch of three large commercial communications satellites by the People's Republic of China. Previously satellite owners were prohibited from exporting their satellites to the PRC. Two of the satellites are for the Australian AUSSAT systems and the third, the refurbished WESTAR 6 returned to earth by U.S. astronauts during a shuttle mission, will become Asiasat for Hong Kong. The State department said it would continue its policy of reviewing export license applications to the PRC on a case-by-case basis. Improved relations with China has been a stated goal of the administration. Opposition to the Chinese launch comes from Western launch agencies which point out the Chinese Long March rocket is a government sponsored project. It represents unfair competition they say. Estimates are that the Chinese launches are available 30 to 50% less than comparable western launches. The decision in the Chinese launcher case does not immediately affect possible western satellite launches by the Soviet Union which the U.S. government currently prohibits under all circumstances.

AMSAT® NA

The Radio Amateur Satellite Corporation

Post Office Box 27
Washington, DC 20044
(301) 589-6062

AO-10 is out of service for an indeterminate period due to poor sun angles. Its beacon has occasionally been heard recently sending garbled PSK telemetry. This indicates the spacecraft IHU is powering down during eclipses and when re-powered, logic circuits assume an indeterminate state. Occasionally the PSK beacon will be commanded by a chance logic state.

Non-Profit
Organization
Second Class
POSTAGE PAID
at
Waterbury, Conn.

LM-1096 KA6M 99.81
MAGNUSKI, HANK
2019 BARBARA DR.
PALO ALTO CA 94303

Amateur Satellite Report (ISSN 0889-6089) is published biweekly for \$20 (inseparable from annual membership dues of \$30) by AMSAT, Post Office Box 27, Washington, DC 20044. Second class postage paid at Silver Spring, MD and additional mailing offices. POSTMASTER: send address changes to *Amateur Satellite Report*, Post Office Box 27, Washington, DC 20044.